Claims

What is claimed is:

1. A device, comprising:

an input fiber to guide an input optical beam;

a reflector having a reflective surface that is partially transmissive to light, said reflector positioned to reflect a part of the input optical beam at said reflective surface as a reflected optical beam and to transmit a part of the input optical beam as a transmitted optical beam;

an output fiber positioned to receive and guide the reflected optical beam as an output optical beam;

an optical detector positioned to receive the transmitted optical beam and to produce a detector output; and

a variable optical attenuator positioned in an optical path between said reflective surface and one of said input and said output fibers to attenuate light in response to a control signal.

2. The device as in claim 1, wherein said variable optical attenuator is positioned to attenuate the input optical beam incident to said reflective surface, and wherein the detector output indicates a power level of the output optical beam.

3. The device as in claim 1, wherein said variable optical attenuator is positioned to attenuate the reflected optical beam, and wherein the detector output indicates a power level of the input optical beam.

4. The device as in claim 1, wherein said variable optical attenuator is a micro attenuation controllable element.

5. The device as in claim 1, wherein said variable optical attenuator attenuates light by scattering light.

6. The device as in claim 1, wherein said variable optical attenuator attenuates light by reflecting light.

7. The device as in claim 1, wherein said variable optical attenuator attenuates light by absorbing light.

8. The device as in claim 1, further comprising a housing to hold said optical detector, said reflector, said variable optical attenuator, said input and said output fibers as an integrated package.

9. The device as in claim 8, said housing has a first end to hold said optical detector and said reflector, and a second, opposing end to hold said input and said output fibers.

10. A method, comprising:

using an input fiber to direct an input beam to a reflective surface that is partially transmissive to produce a reflected beam and a transmitted beam;

using an optical detector located behind the reflective surface to receive the transmitted beam to produce a detector output;

using an output fiber to receive the reflected beam as an output beam; and

using a variable optical attenuator to attenuate either one of the input beam and the reflected beam.

11. The method as in claim 10, wherein the variable optical attenuator is used to attenuate the reflected beam, the method further comprising:

calibrating the detector output to monitor a power level of the input beam.

12. The method as in claim 10, wherein the variable optical attenuator is used to attenuate the input beam, the method further comprising:

calibrating the detector output to monitor a power level of the output beam.

13. A device, comprising:

a housing having a first end and a second opposing end;

an optical detector engaged to said first end;

a collimator lens having a flat end lens facet in said housing to face said optical detector and to transmit a fraction of light to said optical detector;

a magnet in said housing to produce a magnetic field;

a capillary body being in said housing to hold input and output fibers that exit said housing at said second opposing end and having an end facet facing said collimator lens to expose end facets of said input and output fibers to said collimator lens and to the magnetic field, wherein said collimator is configured and spaced from said end facet of said capillary body to collimate light from one fiber and to focus reflected light by said flat end lens facet to another fiber;

a conductive wire movably fixed to said capillary body to have a wire portion across said end fact of said capillary body, said wire movable along said end facet when an electric current

is supplied to said wire to interact with said magnetic field; and

a shutter engaged to said wire portion and movable along with said wire to intercept a beam that is either output by said input fiber or received by said output fiber to attenuate the beam.

14. The device as in claim 13, wherein said shutter scatters the beam when intercepting the beam.

15. The device as in claim 13, wherein said shutter absorbs the beam when intercepting the beam.

16. The device as in claim 13, wherein said shutter reflects the beam when intercepting the beam.

17. The device as in claim 13, further comprising first and second adhesive pads on sides surfaces of said capillary body to bond two parts of said wire to said capillary body as pivot points for motion of said wire.

18. The device as in claim 17, wherein said adhesive pads are elastic and soft to reduce effects of mechanical shocks and vibrations to said wire and said shutter.

19. The device as in claim 18, wherein said adhesive pads are made of an epoxy.

20. The device as in claim 13, further comprising a control unit that controls the electric current in said wire in response to an output of said optical detector.

21. The device as in claim 13, wherein said collimator lens is a GRIN lens.

22. The device as in claim 13, wherein said collimator lens is a C lens.

23. The device as in claim 13, wherein said flat end lens facet is coated with a reflective coating that is partially transmissive.

24. The device as in claim 13, further comprising a partially transmissive mirror engaged to said flat end lens facet.